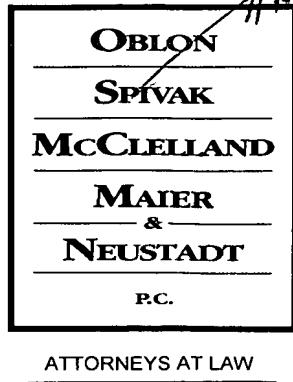




Docket No.: 238023US0X

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313



RE: Application Serial No.: 10/692,753

Applicants: Juergen KOCH, et al.

Filing Date: October 27, 2003

For: ISODECYL BENZOATE MIXTURES,
PREPARATION, AND THEIR USE

Group Art Unit: 1713

Examiner: Robert Harlan

SIR:

Attached hereto for filing are the following papers:

**Appeal Brief; Request for Extension of Time (one month);
Copy of Rule 132 Declaration filed 12-9-05**

Our credit card payment form in the amount of \$620.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

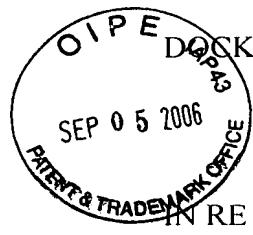
OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon

Thomas M. Cunningham
Registration No. 45,394

Customer Number

22850

(703) 413-3000 (phone)
(703) 413-2220 (fax)



DOCKET NO: 238023US0X

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF

JUERGEN KOCH, ET AL.

: EXAMINER: HARLAN, ROBERT D.

SERIAL NO: 10/692,753

:

FILED: OCTOBER 27, 2003

: GROUP ART UNIT: 1713

FOR: ISODECYL BENZOATE
MIXTURES, PREPARATION, AND
THEIR USE

:

APPEAL BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

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(i) Real Party in Interest

Oxeno Olefinchemie GMBH is the real party in interest.

(ii) Related Appeals or Interferences

The Appellants are unaware of any related appeals or interferences that would directly affect, be directly affected by, or have a bearing on the Board's decision in this appeal.

(iii) Status of the Claims

Claims 15-18 are on Appeal. Claims 15 and 18 are the only independent claims on Appeal.

Claims 23-25 and 28-32 have been allowed and Claims 1-14, 19-22, 26 and 27 have been cancelled.

The Claims Appendix below provides a clean copy of the claims on appeal entered by the Amendment filed April 28, 2006.

(iv) Status of the Amendments

The Advisory Action indicates that the Amendment after final rejection, filed April 28, 2006, will be entered for the purposes of Appeal.

(v) Summary of the Claimed Subject Matter

Claims 15-17 are directed to plastics containing a specific mixture of isodecylbenzoates (page 1, lines 8-11, page 3, lines 9-14). Claim 18 is directed to other products, such as paints, inks, coating materials or adhesives containing the same specific mixture of isodecylbenzoates as Claim 15.

The specific isodecylbenzoate mixture acts as a plasticizer (page 3, lines 5-8) and confers “improved plasticizer properties, such as improved low-temperature-flexibilizing-capability” as well as low viscosity on plastisols (page 3, lines 6-8). A high viscosity is burdensome on the machinery during processing of a plastisol and excessively high gelling temperatures reduce the rate of production (page 2, lines 4-5).

Surprisingly, the inventors have found that “the performance characteristics of the ester mixture can be improved successively as the content of 2-propylheptyl benzoate increases” (page 5, lines 13-14). The specification compares the properties of plasticizers according to the invention (selected to have a high 2-propylheptyl content) and other isodecyl mixtures not having this high content.

Table 1 (page 21) describes four different plastisizer formulations. Formulations A and C correspond to the isodecylbenzoate mixtures used in Claims 15-18 and contain isodecyl benzoates produced from the isodecyl alcohol mixture (90 wt.% of 2-propylheptanol + 10 wt.% of 2-propyl-4-methyl-hexanol)(paragraph bridging pages 18-19).

Formulations B and D do not correspond to the plasticizers used in Claims 15-18, because they are produced with a different mixture of isodecyl benzoates having a very low content of 2-propylheptyl benzoate (pages 19-20, Example 3) are produced from predominantly methyl-branched isodecanol (Exxal 10). The components of Exxal 10 are described in the Declaration filed December 9, 2005.

Tables 2-3 describe the viscosities of plastisols produced using formulations A and C (of the invention) and B and C (comparative example). Plastisol viscosity is slightly lowered by including formulations A and C.

Fig. 1 (Example 6, pages 23-24) show that plastisols produced using formulations A and C (invention) and B and D (comparative example) exhibit similar gelling performance.

Example 7 (pages 25-26) shows that the glass transition temperature for the isodecyl benzoate mixture of the invention (see Examples 2 and 3) was -92°C, while that of the comparative isodecyl mixture (Example 3) was -90°C. The isodecyl mixture incorporated into the plastics of Claims 15-18 provides superior flexibilization, expressed via the glass transition temperature T_G of the plasticizer (page 25, last three lines).

(vi) Ground of Rejection to be Reviewed on Appeal

Whether Claims 15-18 are unpatentable under 35 U.S.C. 103(a) over Arendt et al. (I), U.S. Patent No. 5,236,987, and Arendt et al. (II), WO 89/00173, in view of Godwin et al., WO 97/39060.

(vii) Argument(s)

Issue: Rejection—35 U.S.C. §103

Claims 15-18 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Arendt et al. (I), U.S. Patent No. 5,236,987, and Arendt et al. (II), WO 89/00173, in view of Godwin et al., WO 97/39060. These claims are directed to plastics containing an isodecyl benzoates mixture having a high content of 2-propylheptyl benzoate. There is no suggestion in the cited prior art to make plastics using an isodecyl benzoate mixture having a high content of 2-propylheptyl benzoate, nor is there a reasonable expectation of success in the cited art for obtaining plastics having these improved properties using the isodecyl benzoate mixture of the invention, which has a high content of 2-propylheptyl benzoate.

Arendt (I) and (II) and Godwin do not suggest producing a plastic by selecting a mixture of:

50 to 99% of 2-propylheptyl benzoate and
from 1 to 50% of at least one decyl benzoate selected from the group consisting of 2-isopropyl-4-methylhexyl benzoate, 2-isopropyl-5-methylhexyl benzoate, 2-propyl-4-methylhexyl benzoate, 2-propyl-5-methylhexyl benzoate, and mixtures thereof. Moreover, these documents do not provide any reasonable expectation of success for lowering the glass transition temperature of plastics produces using the benzoates according to the invention.

Arendt (I) is not limited to particular mixtures of isodecyl benzoates but discloses many other compounds, see col. 3, lines 6-11. While these compounds are all disclosed for use in paints, there is no disclosure of the particular isodecyl benzoates of the present claims, such as 2-propylheptyl benzoate, 2-isopropyl-4-methylhexyl benzoate, 2-isopropyl-5-methylhexyl benzoate, 2-propyl-4-methylhexyl benzoate, 2-propyl-5-methylhexyl benzoate or mixtures of the isodecyl benzoates. Moreover, there is no suggestion to specifically select these particular types of isodecyl benzoates for use in plastics or any reasonable expectation

that use of these particular types of isodecyl benzoates would provide any special benefit not shared by all of the benzoates having 8-12 carbon atoms.

Arendt (II) is directed to benzoates having 10-12 carbon atoms for use in paints and plasticsols (see abstract). It too does not disclose plastics containing the particular isodecyl benzoate mixtures of the invention (Claims 23-24), nor provide any reasonable expectation of success for producing plastics which are more flexible at low temperatures by using the isodecyl benzoate mixtures according to the invention.

Godwin discloses C₁₁-C₁₄ benzoates (see abstract), but not C₁₀ benzoates. There is no suggestion or motivation provided by Godwin for including the particular mixtures of isodecyl benzoates of the present invention in plastics, nor any suggestion for the particular mixtures of Claims 23-24.

There are many different isomers of isodecyl alcohol and their esterified products isodecyl benzoates. The claims are directed to plastics incorporating isodecyl benzoates with a high concentration of 2-propylheptyl benzoate which have properties that are not shared by the genus of C₈-C₁₂ benzoates disclosed by the prior art. For example, the claimed plastics incorporate isodecyl benzoates that have low glass transition temperatures compared to other isodecyl benzoates and thus provide greater low-temperature flexibilization potential.

Exxal 10 is an example of an isodecyl benzoate that falls outside of the mixtures required by claims and which is formed predominantly from isodecyl isomers other than 2-propylheptyl benzoate. Unlike the isodecyl benzoate mixtures required by the invention, the Exxal 10 benzoate has a very low (3.6% or less) concentration of isodecyl benzoate based on 2-propylheptanol.

The Exxal 10 benzoate contains a high concentration of isodecyl benzoates having branching methyl groups (see the specification, page 19, last two lines) and has different physical and functional properties.

On the other hand, the inventors have discovered that mixtures of isomeric decyl benzoates having a high content of 2-propylheptyl benzoate have lower glass transition temperatures and would impart desirable low temperature flexibility to plastics. The isodecyl benzoate mixtures of the invention contain high concentrations of isodecyl benzoate produced from 2-propylheptanol—at least **50%** compared to the **3.6%** or less of the comparative isodecyl benzoate mixtures (i.e., Exxal 10 benzoates). As shown by Example 7 in the specification and by new Examples A and B in the previously-filed Declaration, isodecyl benzoates produced from 98% pure 2-propylheptanol (Example A) or a mixture containing 52% 2-propylheptanol have lower glass transition temperatures than the isodecyl benzoates produced using Exxal 10:

Benzoic acid ester from:	Glass transition temperature (Tg)
90% 2-propylheptanol + 10% 2-propyl-4-methylhexanol (Example 2)	-92°C
Exxal 10 ≤ 3.6% 2-propyl heptanol; predominantly methyl-branched isodecanol (Comparative Example 3)	-90°C
98% 2-propylheptanol (Declaration, Example A)	-93°C
52% 2-propylheptanol (Declaration, Example B)	-91.3°C

As shown in the table above, selection of isodecyl benzoate mixtures according to the invention, which have lower glass transition temperatures, would confer superior low temperature flexibility on plastics like PVC. Plastics produced with a plasticizer having a lower glass transition temperature would remain flexible at a lower temperature than plastics produced with a plasticizer having a high T_G. For example, the Space Shuttle Challenger disaster was caused by rubber O-rings that were below their glass transition temperature on

an unusually cold Florida morning, and thus could not flex adequately to form proper seals between sections of the two solid-fuel boosters. These plastics of Claims 15-18 would be expected to have improved low temperature flexibility, because they incorporate the isodecyl benzoates having low glass transition temperatures as plasticizers. Moreover, based on the Examples, these plastics would have favorable viscosity and gelling properties.

Accordingly, since the prior art neither suggests nor provides a reasonable expectation of success for the plastics of the invention which contain a plasticizer having a high content of 2-propylheptyl benzoate, the Applicants respectfully request that this rejection be reversed.

RELIEF REQUESTED

The Appellants respectfully request reversal of the grounds of rejection of Claims 15-18 under 35 U.S.C. §103(a) and the allowance of this application.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon

Customer Number

22850


Thomas M. Cunningham
Registration No.: 45,394

(viii) Claims Appendix (Reflects entry of Amendment after final rejection)

Claims 1-14 (Cancelled)

Claim 15 (Previously Presented): A plastic comprising a plasticizer which contains:
a mixture of isomeric decyl benzoates, comprising:
from 50 to 99% of 2-propylheptyl benzoate and
from 1 to 50% of at least one decyl benzoate selected from the group consisting of 2-isopropyl-4-methylhexyl benzoate, 2-isopropyl-5-methylhexyl benzoate, 2-propyl-4-methylhexyl benzoate, 2-propyl-5-methylhexyl benzoate, and mixtures thereof.

Claim 16 (Previously Presented): The plastic of Claim 15,
which is selected from the group consisting of PVC, PVB, a homopolymer and a copolymer,

wherein said homopolymer or copolymer is based on
ethylene,
propylene,
butadiene,
vinyl acetate,
glycidyl acrylate,
glycidyl methacrylate,
acrylates,
acrylates bonded to the oxygen atom of the ester group, alkyl radicals of branched or unbranched alcohols having from 1 to 10 carbon atoms,
styrene or acrylonitrile,

homo- or copolymers of cyclic olefins, and
combinations thereof.

Claim 17 (Previously Presented): The plastic of Claim 15,
which is selected from the group consisting of:
polyacrylate having identical or different alkyl radicals having from 4 to 10 carbon
atoms bonded to the oxygen atom of the ester group,
polymethacrylate,
polymethyl methacrylate,
methyl acrylate-butyl acrylate copolymer,
methyl methacrylate-butyl methacrylate copolymer,
ethylene-vinyl acetate copolymer,
chlorinated polyethylene,
nitrile rubber,
acrylonitrile-butadiene styrene copolymer,
ethylene-propylene copolymer,
ethylene-propylene-diene copolymer,
styrene-acrylonitrile copolymer,
acrylonitrile-butadiene rubber,
styrene-butadiene elastomer,
methyl methacrylate-styrene-butadiene copolymer,
nitrocellulose, and
combinations thereof.

Claim 18 (Previously Presented): A paint, ink or coating material, adhesive, or sealing compound, comprising:

a mixture of isomeric decyl benzoates, comprising:

from 50 to 99% of 2-propylheptyl benzoate and

from 1 to 50% of at least one decyl benzoate selected from the group consisting of 2-isopropyl-4-methylhexyl benzoate, 2-isopropyl-5-methylhexyl benzoate, 2-propyl-4-methylhexyl benzoate, 2-propyl-5-methylhexyl benzoate, and mixtures thereof.

Claims 19-22 (Cancelled)

Claim 23 (Previously Presented): A composition containing from 5 to 90% by weight a mixture of isomeric decyl benzoates, comprising:

from 50 to 99% of 2-propylheptyl benzoate and

from 1 to 50% of at least one decyl benzoate selected from the group consisting of 2-isopropyl-4-methylhexyl benzoate, 2-isopropyl-5-methylhexyl benzoate, 2-propyl-4-methylhexyl benzoate, 2-propyl-5-methylhexyl benzoate, and mixtures thereof; and

from 10 to 95% by weight of

diisobutyl adipate or one or more C₄-C₁₃ alkyl cyclohexanedicarboxylates.

Claim 24 (Previously Presented): The composition of Claim 23, which contains 10 to 95% of dialkyl adipate.

Claim 25 (Previously Presented): The composition as claimed in Claim 23, which contains 10 to 95% of diisobutyl cyclohexanedicarboxylate.

Claims 26-27 (Cancelled)

Claim 28 (Previously Presented): A mixture of isomeric decyl benzoates, comprising:

from 50 to 99% of 2-propylheptyl benzoate and

from 1 to 50% of at least one decyl benzoate selected from the group consisting of 2-isopropyl-4-methylhexyl benzoate, 2-isopropyl-5-methylhexyl benzoate, 2-propyl-4-methylhexyl benzoate, 2-propyl-5-methylhexyl benzoate, and mixtures thereof, further comprising of one or more di- C₄-C₁₃-alkyl adipates, or one or more C₄-C₁₃ alkyl cyclohexanedicarboxylates.

Claim 29 (Previously Presented): The mixture as claimed in Claim 28, which further comprise one or more di- C₄-C₁₃-alkyl adipates.

Claim 30 (Previously Presented): The mixture as claimed in Claim 28, further comprising one or more C₄-C₁₃ alkyl cyclohexanedicarboxylates.

Claim 31 (Previously Presented): The mixture as claimed in Claim 28, further comprising a C₄-C₁₃ alkyl cyclohexanedicarboxylate which is diisononyl cyclohexanedicarboxylate.

Claim 32 (Previously Presented): The mixture as claimed in Claim 28, further comprising a di- C₄-C₁₃-alkyl adipate which is diisononyl adipate.

(ix) Evidence Appendix

Declaration under 37 C.F.R. 1.132 filed December 9, 2005.



COPY

238023US0X

Docket No.:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:

GROUP: 1713

Juergen KOCH, et al.

SERIAL NO: 10/692,753

EXAMINER: Harlan, R.

FILED: October 27, 2003

FOR: ISODECYL BENZOATE MIXTURES, PREPARATION, AND THEIR USE

DECLARATION UNDER 37 C.F.R. 1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

Sir:

Now comes Michael Graß who deposes and states that:

1. I am a graduate of chemistry and received my doctorate degree in the year 1995.
2. I have been employed by Oxeno Olefinchemie GmbH for 9 years as a Manager in the field of Application Technology of Plasticizers.
3. The following experiments were carried out by me or under my direct supervision and control.

4. Example A:

The esterification described in Example 2 was repeated using a 98% pure 2-propylheptanol instead of the alcohol mixture used in that example.

The glass transition temperature (T_g) of the corresponding benzoate ester was measured by means of TGA according to Example 7. The T_g was found to be -93 °C.

5. Example B:

A mixture of 17% 2-Isopropyl-5-methyl-hexenol-1, 71% 2-Propyl-5-methylhexanol-1, 4% 2-Isopropyl-heptanol-1 and 7% 2-Propylheptanol was mixed in a mass ratio of 1:1 with the alcohol used in Example A. The resulting mixture consisted of 52% 2-propylheptanol. This

new mixture was used to esterify benzoic acid according to the procedure described in Example 2.

The T_g of this isodecyl benzoate was -91.3°C , which is still superior with regard to the T_g of the comparative Example 3 (using Exxal 10 as alcohol).

6. Test Report according to DIN EN ISO/IEC 174025 showing that Exxal 10 (isodecanol) contains a maximum of 3.6% 2-propyl heptanol.

First, the Exxal 10 sample (see attachment describing Exxal 10) was diluted in methanol 1:10 and then analyzed. After recording the chromatogram a known portion of 2-propylheptanol was added to the sample and analyzed again to clearly identify the peak of 2-propylheptanol. These data are shown in the attached chromatograms.

	Peak with RT of 2-propylheptanol in the sample Exxal 10	Peak with RT of 2-propylheptanol in the sample Exxal 10 added with 2-propylheptanol
Area %	3.6	5.0

The identification of the signal for 2-propylheptanol was done only by comparing retention times. The content of 3.6% therefore is a maximum value. If another component superimposes this signal the real content of 2-propylheptanol would be even lower.

7. The above data were obtained by analyzing an Exxal 10 sample using the following equipment, parameters and method:

Apparatus: Gas chromatograph with FID and integrator, e.g. Agilent gas chromatograph 5890 and integrator 3396 of Agilent ChemStation software.

Column: fused silica capillary column

Stationary phase: polyethylene glycol, e.g. Stabilwax, Restek

Length: 60 m

Internal diameter: 0.25 mm

Film Thickness: 0.25 μm

Carrier gas: helium

Column head pressure: 200 kPa

Column flow rate: ca. 2 ml/min

Split: ca. 100 ml/min

Temperatures:

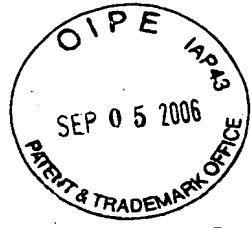
Oven temperature: 60°C - 2°C/min-220°C

Injector temperature: 225°C

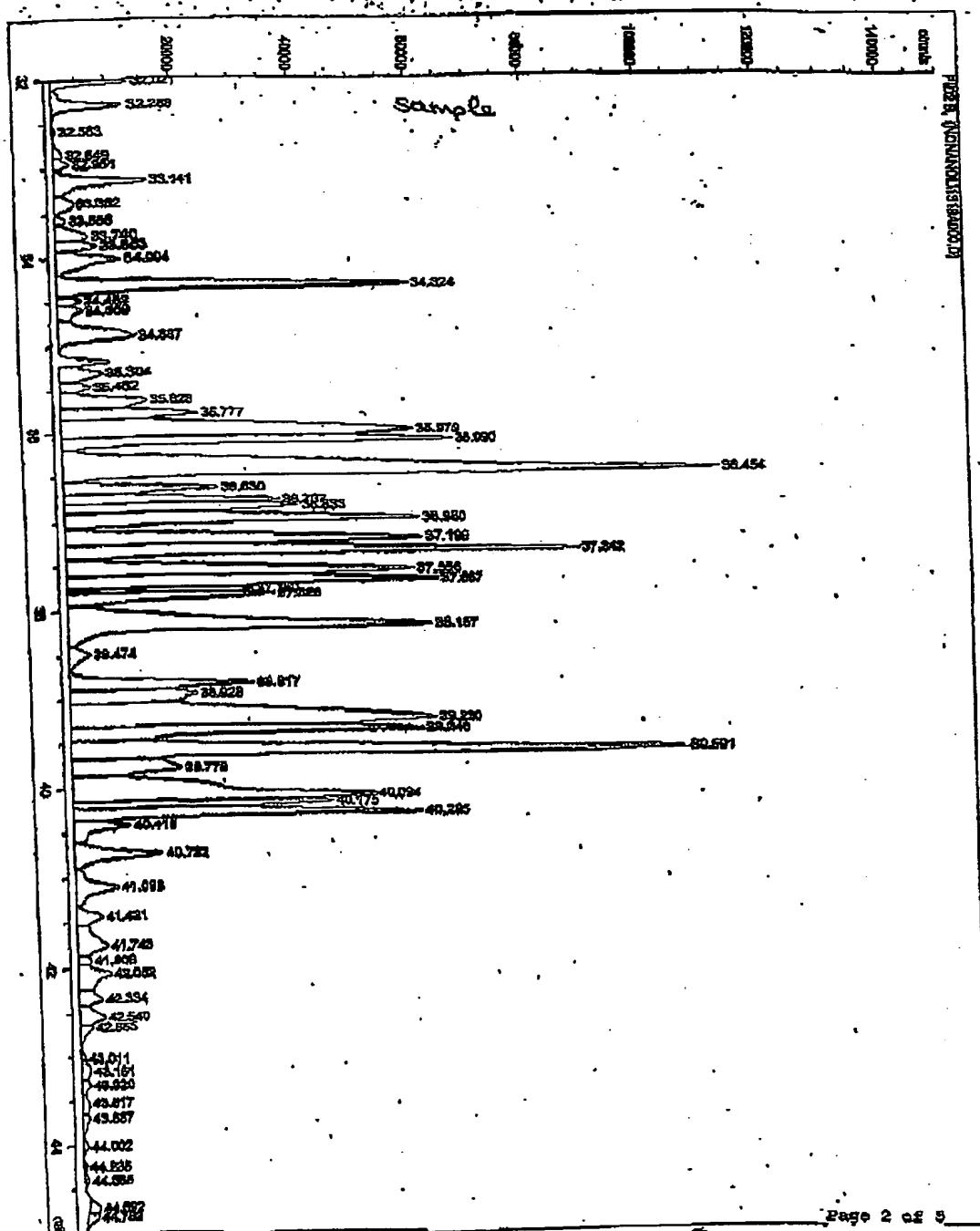
Detector temperature: 225°C

Sample volume injected: 0.4 µm diluted in methanol (1:10)

Evaluation: normalization to 100 area-%

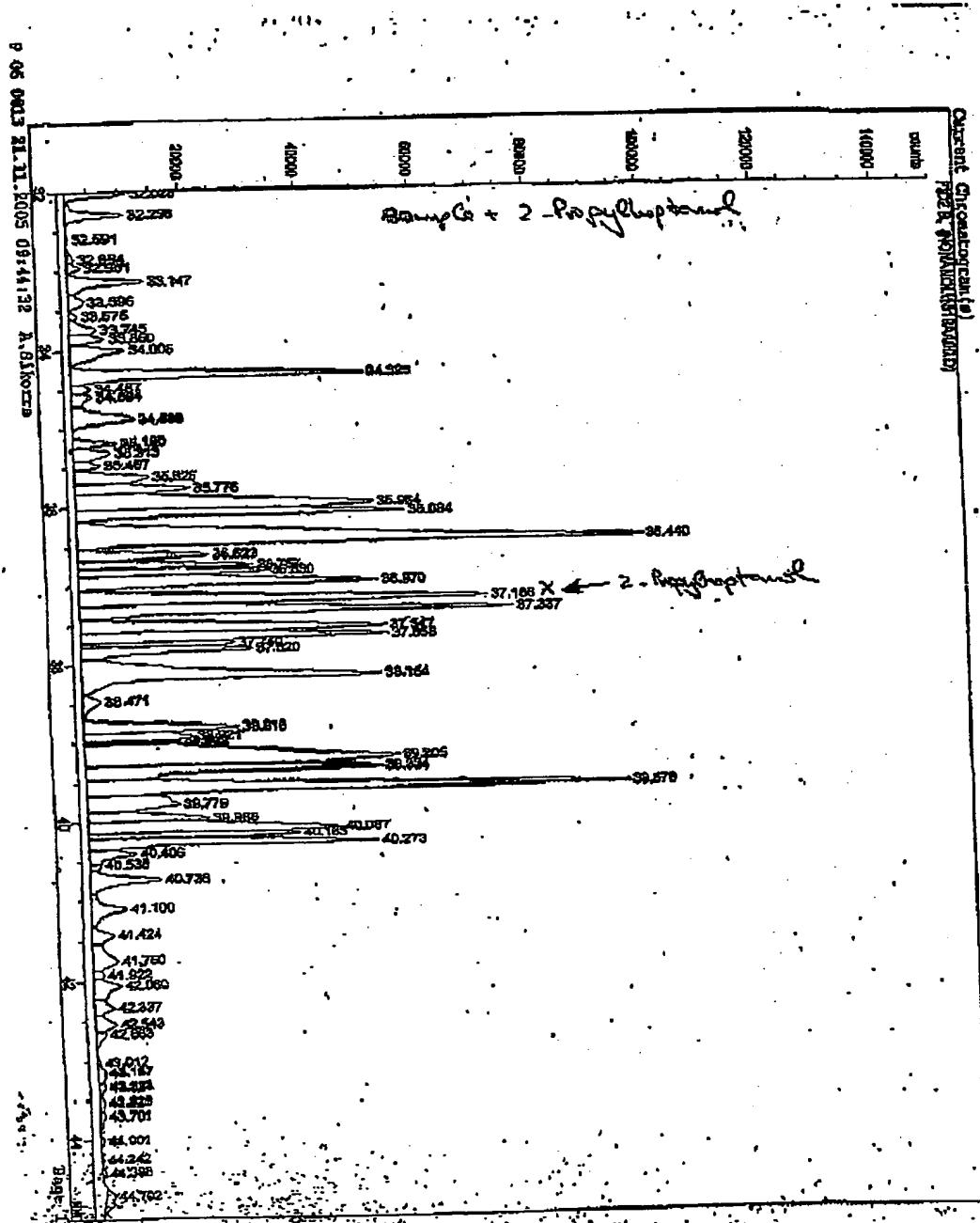


8.

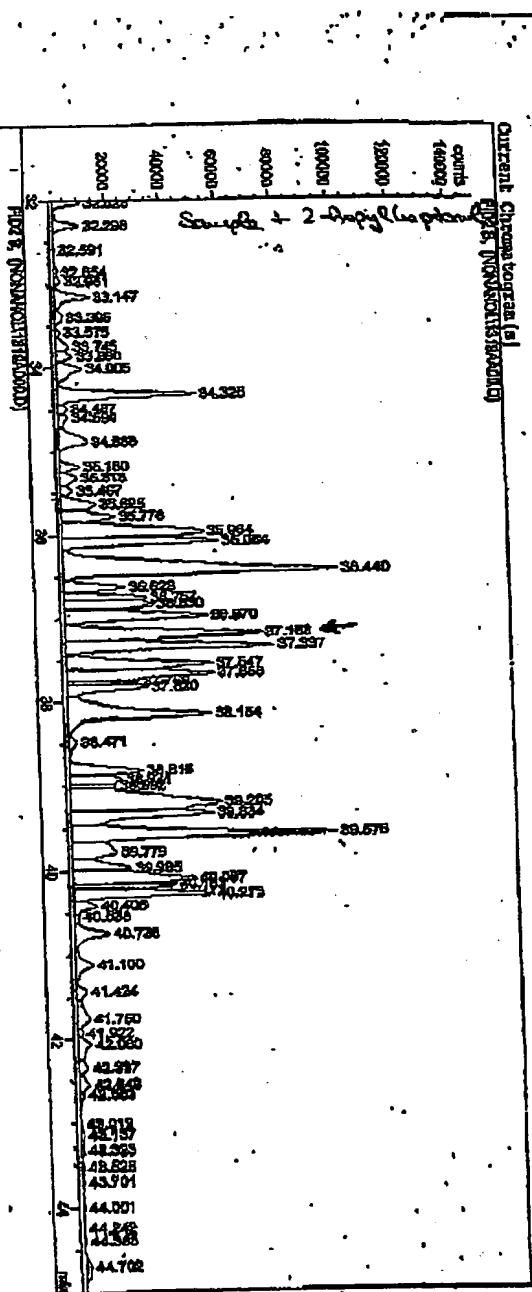


Printed at 10:00 AM 30/05/2011 Current chromatogram(s)

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Page 1 of 1

9

Higher Alcohols

From August 2005 to August 2006

ExxonMobil
Chemical

Exxal 10

Isodecanol ($C_{10}H_{22}O$)

CAS Number: 93821-11-5
EINECS Number: 2986966

Specifications

Property	Units	Min	Max	Typical values	Test method
Purity	wt% total alcohol	98.0		98.6	ROP 103/04
Carbonyl number	mgKOH/g	0.20		0.10	ISO 1843-9/77
Acid value	mgKOH/g	0.05		0.03	ASTM D-1045/95
Distillation - Initial - Dry point	°C	216		218 226 224	ASTM D-1078/03*
Colour	Ph-Co	10	6		ASTM D-1209/00
Density at 20°C	g/cm³	0.836	0.840	0.838	ASTM D-4052/96
Water content	wt%	0.10	0.03		ASTM E-1084/04a

- Modified. Value may be determined by ExxonMobil procedures equivalent to industry standard test methods. Applicable sampling and testing methods are subject to change without notice and are available for review on request.

Volume August 2025 M.L. 040

10. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

11. Further deponent saith not.

J. J. Foy
Signature

December 8th, 2005

Date

Customer Number

22850

Tel. (703) 413-3000
Fax. (703) 413-2220
(08MMN 07/05)
1FATTY\TMC\238023US-DEC132.DOC